10/9/2009

RELIABILITY REPORT
FOR

DS12C887, Batangas Bent Frame Assembly, Pb-Free

Maxim Integrated Products

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Prepared by:

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Conclusion:

The following qualification successfully meets the quality and reliability standards required of all Dallas Semiconductor products and processes:

DS12C887, Batangas Bent Frame Assembly, Pb-Free

In addition, Dallas Semiconductor's continuous reliability monitor program ensures that all outgoing product will continue to meet Maxim's quality and reliability standards. The current status of the reliability monitor program can be viewed at http://www.maxim-ic.com/TechSupport /dsreliability.html.*

Module Description

A description of this Module can be found in the product data sheet. You can find the product data sheet at http://dbserv.maxim-ic.com/l_datasheet3.cfm.*

Reliability Derating:

A module device consists of one or more IC's in a single, upward integrated, package. This package is assembled to include batteries, crystals, and other piece parts that make up the configuration of the Module. Because of either the complexity of the package or the included piece parts, standard high temperature reliability testing is not possible. Therefore, in order to determine the reliability of module products, the reliability of each of the piece parts is individually determined, then summed to determine the reliability of the integrated module product. If there are "n" significant components in the module then:

Fr (module) = Fr (1) + Fr (2) + Fr (3) + ... + Fr (n)
Fr (module) = Failure rate of module
Fr(n) = Failure rate of the nth component

Failure Rates are reported in FITs (Failures in Time) or MTTF (Mean Time To Failure). The FIT rate is related to MTTF by:

MTTF = 1/Fr

NOTE: MTTF is frequently used interchangeably with MTBF.

The calculated failure rate for this module/assembly is:

Module Device:	Module Units:	Quantity:	Fails:	Ea:	Beta:	MTTF (Yrs):	FITs:
BR1225	**1**	**100**	**1**	**1.0**	**0.0**	**175984**	**0.6**
CRYSTAL	**1**	**100**	**0**	**0.7**	**0.0**	**12463**	**9.2**
DS12C885	**1**	**154**	**0**	**0.7**	**0.0**	**18096**	**6.3**
Totals:						**7083**	**16.1**

The parameters used to calculate the module failure rate are as follows

Cf: 60% **Tu: 25** **°C** **Vu: 5.5** **Volts**

The reliability data follows. At the start of this data is the module assembly information. This is a description of the module. The next section is the detailed reliability data for each stress found in the qualification / monitor. If there are additional processes or assemblies used as part of this report, a description of each will follow which includes the respective reliability data for that process/ assembly. The reliability data section includes the latest data available. Some of this data may be generic with other packages or products.

* Some proprietary products may be excepted from this requirement

Assembly Information:

Assembly Site:	Batangas Assembly
Pin Count:	24
Package Type:	Module Bent Frame (Pb-Free)
Body Size:	720
Mold Compound:	Amicon
Lead Frame:	Stamped Alloy 42
Lead Finsh:	Sn Dip 100%
Die Attach:	84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size:	Au / 1.3 mil
Flammability:	UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A)	NA
Date Code Range:	0713 to 0713

DATE CODE: 0713 **LOT NUMBER:** MG360507-QUAL **VEHICLE:** DS12CR887

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
BIASED MOISTURE	0713	85/85, 5.5 VOLTS	1000 HRS	77	0	
VISUAL INSPECTION	0713	WHISKERS < 50uM		77	0	
			Total:		**0**	

PACKAGE TESTS

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
X-RAY FLUORESCENCE	0713	TO BE DONE BY F/A		12	0	
SOLDERABILITY (Sn/Pb)	0713	JESD22-B102, COND C (215C)		6	0	
SOLDERABILITY (Pb-Free)	0713	JESD22-B102, COND C (245C)		6	0	
			Total:		**0**	

STORAGE LIFE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0713	85 C	1000 HRS	77	0	
VISUAL INSPECTION	0713	WHISKERS < 50uM		77	0	
			Total:		**0**	

TEMPERATURE CYCLE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE, 5' RAMP, 10' DWELL	0713	-40 TO 85C	1000 CYS	77	0	
VISUAL INSPECTION	0713	WHISKERS < 50uM		77	0	
			Total:		**0**	

Assembly Information:

Assembly Site:	Batangas Assembly
Pin Count:	24
Package Type:	Module Bent Frame (Pb-Free)
Body Size:	720
Mold Compound:	Amicon
Lead Frame:	Stamped Copper CDA194
Lead Finsh:	Sn Dip 100%
Die Attach:	84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size:	Au / 1.3 mil
Flammability:	UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A)	NA
Date Code Range:	0914 to 0914

DATE CODE: 0914 **LOT NUMBER:** MG367486-QUAL **VEHICLE:** DS12887

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
BIASED MOISTURE	0914	85/85, 5.5 VOLTS	1000 HRS	77	0	
VISUAL INSPECTION	0914	WHISKERS < 50uM		3	0	
			Total:		**0**	

PACKAGE TESTS

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
SOLDERABILITY (Pb-Free)	0914	JESD22-B102, COND C (245C)		3	0	
SOLDERABILITY (Sn/Pb)	0914	JESD22-B102, COND C (245C)		3	0	
X-RAY	0914	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS	0914	JESD22-B100		6	0	
MARK PERMANENCY	0914	JESD22-B107		6	0	
LEAD INTEGRITY	0914	JESD22-B105, COND B		6	0	
			Total:		**0**	

STORAGE LIFE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0914	85 C	1000 HRS	77	0	
VISUAL INSPECTION	0914	WHISKERS < 50uM		3	0	
			Total:		**0**	

TEMPERATURE CYCLE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE, 5' RAMP, 10' DWELL	0914	-40 TO 85C	1000 CYS	77	0	
VISUAL INSPECTION	0914	WHISKERS < 50uM		3	0	
			Total:		**0**	

DATE CODE: 0914 **LOT NUMBER:** MG367487-QUAL **VEHICLE:** DS12887

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
BIASED MOISTURE	0914	85/85, 5.5 VOLTS	1000 HRS	75	0	
VISUAL INSPECTION	0914	WHISKERS < 50uM		3	0	
			Total:		**0**	

PACKAGE TESTS

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
SOLDERABILITY (Sn/Pb)	0914	JESD22-B102, COND C (245C)		3	0	
X-RAY	0914	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS	0914	JESD22-B100		6	0	
MARK PERMANENCY	0914	JESD22-B107		6	0	
LEAD INTEGRITY	0914	JESD22-B105, COND B		6	0	
			Total:		**0**	

STORAGE LIFE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0914	85 C	1000 HRS	77	0	
VISUAL INSPECTION	0914	WHISKERS < 50uM		3	0	
			Total:		**0**	

TEMPERATURE CYCLE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE, 5' RAMP, 10' DWELL	0914	-40 TO 85C	1000 CYS	77	0	
VISUAL INSPECTION	0914	WHISKERS < 50uM		3	0	
			Total:		**0**	

DATE CODE: 0914 **LOT NUMBER:** MG367488-QUAL **VEHICLE:** DS12887

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
BIASED MOISTURE	0914	85/85, 5.5 VOLTS	1000 HRS	70	0	
VISUAL INSPECTION	0914	WHISKERS < 50uM		3	0	
			Total:		**0**	

PACKAGE TESTS

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
SOLDERABILITY (Pb-Free)	0914	JESD22-B102, COND C (245C)		3	0	
SOLDERABILITY (Sn/Pb)	0914	JESD22-B102, COND C (245C)		3	0	
X-RAY	0914	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS	0914	JESD22-B100		6	0	
MARK PERMANENCY	0914	JESD22-B107		6	0	
LEAD INTEGRITY	0914	JESD22-B105, COND B		6	0	
X-RAY FLUORESCENCE	0914	TO BE DONE BY F/A		6	0	
			Total:		**0**	

STORAGE LIFE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0914	85 C	1000 HRS	77	0	
VISUAL INSPECTION	0914	WHISKERS < 50uM		3		
			Total:		**0**	

TEMPERATURE CYCLE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE, 5' RAMP, 10' DWELL	0914	-40 TO 85C	1000 CYS	77	0	
VISUAL INSPECTION	0914	WHISKERS < 50uM		3	0	
			Total:		**0**	